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## Evaluation of okra (*Abelmoschus esculentus*) hybrids under Prayagraj agro climatic conditions

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### Abstract

The present investigation entitles “Evaluation of okra (*Abelmoschus esculentus*) hybrids under Prayagraj Agro climatic conditions” was conducted during the rabi season of 2022-2023 at central research farm, department of horticulture, Sam Higginbottom University of Agriculture, Technology and Science, Naini, Prayagraj. The present study was laid out in simple randomized block design with 10 hybrids which were replicated thrice. The hybrids were H<sub>1</sub> (Anmol), H<sub>2</sub> (Aryushi), H<sub>3</sub> (Super Sneha), H<sub>4</sub> (Sonali-99), H<sub>5</sub> (Sharmili), H<sub>6</sub> (Julie), H<sub>7</sub> (Amanat), H<sub>8</sub> (Karishma), H<sub>9</sub> (Nandini-7080), H<sub>10</sub> (Best Green-11). On the basis of our experimental finding, it is concluded that the hybrid H<sub>7</sub> AMANAT was found to be best in term of vegetative parameters, quality parameters, yield. While, the highest net return was found in hybrid H<sub>7</sub> AMANAT & ECONOMICS with highest B:C ratio with (3.05).

**Keywords:** Hybrids, okra, growth, development, yield and quality

### Introduction

Okra (*Abelmoschus esculentus*) is an annual vegetable crop propagated by seeds in Tropical and Subtropical region of the world like India, Africa, Turkey and other neighboring countries. Okra has captured a prominent position among vegetables.

Okra is more remunerative than leafy vegetables. In India, okra is one of the most important vegetable crops grown for its tender green fruits during summer and rainy seasons. Okra is a polyploidy, belongs to the family Malvaceae and a self-pollinated crop. Occurrence of out crossing to an extent of 4 – 19 percent with the maximum of 42.2 percent is noticed with the insect assisted pollination.

Okra (*Abelmoschus esculentus* L.) is an important vegetable grown for its green tender fruits which are used as a vegetable in a variety of ways. It is rich in vitamins, calcium, potassium and other minerals matter. It can be fried and cooked with necessary ingredients. The tender fruit can be cut into small pieces, boiled and served with soup. Matured fruit and stems containing crude fiber are used in the paper industry.

Okra is a vegetable widely cultivated in the world. It is considered important throughout the tropical and subtropical regions of Africa and Asia, with an annual estimated production of six million tons. In Pakistan, okra crop is grown on an area of 15,081 ha with an annual production of 114,657 tons. Globally, India ranks first in okra production, having an area of 509 ha with an annual production of 6094.9 million tons and productivity of 12 million tones/ha.

### Materials and Methods

The present investigation entitles “Evaluation of okra (*Abelmoschus esculentus*) hybrids under Prayagraj Agro climatic conditions” was conducted during the rabi season of 2022-2023 at central research farm, department of horticulture, Sam Higginbottom University of Agriculture, Technology and Science, Naini, Prayagraj. The present study was laid out in simple randomized block design with 10 hybrids which were replicated thrice. The hybrids were H<sub>1</sub> (Anmol), H<sub>2</sub> (Aryushi), H<sub>3</sub> (Super Sneha), H<sub>4</sub> (Sonali-99), H<sub>5</sub> (Sharmili), H<sub>6</sub> (Julie), H<sub>7</sub> (Amanat), H<sub>8</sub> (Karishma), H<sub>9</sub> (Nandini-7080), H<sub>10</sub> (Best Green-11). To study was carried out the performance of different hybrids of Okra (*Abelmoschus esculentus*) in terms of growth, and yield of okra.

## Results and Discussion

### Growth characters

Maximum plant height (15, 30, 45, 60 and 75 das) (6.44, 9.08, 15.75, 47.97 & 68.54) cm respectively was observed in hybrid H<sub>7</sub> (Amanat) followed by (6.13, 9.01, 15.08, 45.46 & 67.93) cm respectively with hybrid H<sub>3</sub> (Super Sneha) and minimum plant height (3.94, 7.55, 9.75, 35.59, & 56.68) cm respectively was observed in hybrid H<sub>8</sub> Karishma.

Maximum number of leaves per plant (25, 50 and 75 das) (5.00, 10.27, & 17.44 respectively) was observed in hybrid H<sub>7</sub> (Amanat) followed by (4.88, 10.00, 16.95) with hybrid H<sub>3</sub> (super Sneha) and minimum number of leaves per plant (3.72, 7.11, 13.94) was observed in hybrid H<sub>8</sub> Karishma.

Maximum number of branches per plant (40 and 60 das) (5.48, & 7.97 respectively) was observed in hybrid H<sub>7</sub> (Amanat) followed by (5.4, & 7.68) with hybrid H<sub>3</sub> (Super Sneha) and minimum number of branches per plant (3.8, & 6.08) was observed in hybrid H<sub>8</sub> Karishma.

Minimum days taken to 1<sup>st</sup> flowering recorded (47.16 days) was observed in hybrid h<sub>7</sub> (Amanat) followed by (47.55 days) with hybrid h<sub>3</sub> (Super Sneha) with and the maximum days taken to 1<sup>st</sup> flowering was recorded in (51.16 days) with hybrid H<sub>8</sub> (Karishma).

Minimum days to 50% flowering recorded (53.23 days) was observed in hybrid H<sub>7</sub> (Amanat) followed by (54.88 days) with hybrid H<sub>3</sub> (Super Sneha) and maximum days to 50% flowering (59.60 days) was observed in hybrid H<sub>8</sub> (Karishma).

Minimum days taken to 1<sup>st</sup> picking recorded (58.17 days) was observed in hybrid H<sub>7</sub> (amanat) followed by (58.24 days) with hybrid H<sub>3</sub> (Super Sneha) with and the maximum days taken to 1<sup>st</sup> flowering was recorded in (63.72 days) with hybrid H<sub>8</sub> (Karishma).

### Discussion

The increase in growth, yield, and quality of okra hybrids under Prayagraj Agro-climatic conditions can be attributed to several factors inherent to the region environment and the characteristics of the okra hybrids themselves.

Firstly, Prayagraj Agro-climatic conditions, characterized by warm temperatures, moderate rainfall, and fertile soils, provide an optimal environment for okra growth. The region's extended warm growing season allows for prolonged vegetative growth and fruit development, contributing to higher yields.

Additionally, the okra hybrids selected for cultivation in Prayagraj likely possess traits that are well-suited to the region's conditions. These hybrids may exhibit improved disease resistance, tolerance to heat stress, and enhanced nutrient uptake, all of which contribute to healthier plants and increased productivity.

Moreover, advancements in agricultural practices, such as the adoption of precision farming techniques, efficient irrigation methods, and appropriate fertilization regimes, further optimize growth conditions for okra hybrids in Prayagraj. These practices ensure that plants receive adequate nutrients and water, promoting vigorous growth and higher yields.

Furthermore, the synergy between environmental factors and genetic potential plays a crucial role in enhancing the quality of okra produced in Prayagraj. The hybrids selected for cultivation likely possess desirable traits such as uniform fruit size, tender texture, vibrant color, and superior taste, meeting consumer preferences and market demands.

In conclusion, the increase in growth, yield, and quality of okra hybrids under Prayagraj Agro-climatic conditions is the result of a combination of favorable environmental factors, well-adapted hybrid characteristics, and improved agricultural practices.

**Table 1:** Evaluation of okra hybrids for plant height, Number of leaves/plant, and Number of branches/plant.

Notation	Hybrids	Plant Height (cm)					No. of Leaves/plant			No. of Branches/Plant	
		15 DAS	30 DAS	45 DAS	60 DAS	75 DAS	25 DAS	50 DAS	75 DAS	40 DAS	60 DAS
H <sub>1</sub>	ANMOL	5.20	8.75	14.89	39.47	63.31	4.11	7.83	13.55	3.53	7.03
H <sub>2</sub>	ARYUSHI	5.41	9.89	13.33	43.13	64.11	4.66	8.61	13.55	4.67	7.26
H <sub>3</sub>	SUPER SNEHA	6.13	9.91	15.08	45.46	67.93	4.88	10.00	16.95	5.4	7.68
H <sub>4</sub>	SONALI-99	5.13	8.69	13.64	37.60	59.53	4.49	8.61	16.39	4.82	6.81
H <sub>5</sub>	SHARMILI	4.82	8.69	12.50	38.81	58.98	4.27	7.72	14.00	3.63	6.74
H <sub>6</sub>	JULIE	5.39	8.88	12.46	39.01	60.77	4.16	6.94	14.11	3.4	6.89
H <sub>7</sub>	AMANAT	6.44	9.08	15.75	47.97	68.54	5.00	10.27	17.44	5.48	7.97
H <sub>8</sub>	KARISHMA	3.94	7.55	9.75	35.59	56.68	3.72	7.11	13.94	3.8	6.08
H <sub>9</sub>	NANDANI-7080	5.47	8.04	12.20	44.74	57.48	4.16	9.22	16.05	4.36	7.24
H <sub>10</sub>	BEST GREEN-11	5.66	8.16	14.24	36.18	65.40	4.28	7.12	15.55	4.24	7.18
	F test	S	S	S	S	S	S	S	S	S	S
	S. ED. ±	0.591	1.878	1.222	0.96	0.588	0.439	0.467	0.657	0.125	0.621
	CD@5%	1.251	3.756	2.444	1.92	1.176	0.88	0.93	1.31	0.248	1.258
	CV	3.338	6.50	4.23	3.32	2.03	1.56	1.66	2.34	0.698	2.458

**Table 2:** evaluation of okra hybrids for Days taken to 1<sup>st</sup> flowering, Days taken to 50% flowering and Days taken to 1<sup>st</sup> picking

Notation	Hybrids	Days taken to 1 <sup>st</sup> flowering	Days taken to 50% flowering	Days taken to 1 <sup>st</sup> picking
H <sub>1</sub>	ANMOL	48.61	54.98	58.60
H <sub>2</sub>	ARYUSHI	49.89	57.38	61.44
H <sub>3</sub>	SUPER SNEHA	47.55	54.88	58.24
H <sub>4</sub>	SONALI-99	48.88	56.23	61.83
H <sub>5</sub>	SHARMILI	49.44	57.59	61.00
H <sub>6</sub>	JULIE	49.00	56.58	60.16
H <sub>7</sub>	AMANAT	47.16	53.23	58.17
H <sub>8</sub>	KARISHMA	51.16	59.60	63.72
H <sub>9</sub>	NANDANI-7080	48.77	57.60	61.28
H <sub>10</sub>	BEST GREEN-11	50.72	56.55	60.94
	F test	S	S	S
	S. ED. ±	1.799	1.035	1.045
	CD@5%	3.598	2.191	2.212
	CV	6.296	6.623	2.476

### Conclusion

On the basis of our experimental finding, it is concluded that the hybrid H<sub>7</sub> AMANAT was found to be best in term of vegetative parameters, quality parameters, yield. While, the highest net return was found in hybrid H<sub>7</sub> Amanat & Economics with highest B:C ratio with (3.05).

Hence, it could be concluded that hybrid H<sub>7</sub>/AMANAT was noted superior among all the hybrids of Okra.

### Future Prospects

The evaluation of okra hybrids presents promising future prospects in agriculture. As global population increases and climate change challenges traditional farming methods, the identification and promotion of high-yielding, resilient okra hybrids become increasingly crucial. This research offers the potential to revolutionize okra cultivation by identifying hybrids with superior traits such as disease resistance, drought tolerance, and enhanced nutritional value. By selecting hybrids tailored to specific environmental conditions and market demands, farmers can improve crop productivity and income stability. Furthermore, the dissemination of successful hybrids could enhance food security, particularly in regions where okra is a staple crop. Overall, this research lays the groundwork for sustainable okra production, contributing to the resilience and prosperity of agricultural communities worldwide.

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